Chemistry 141 Name

Dr. Cary Willard

Quiz 10A (20 points) May 5, 2008

All work must be shown to receive credit.

1. (8 points) Dichloromethane has a vapor pressure of 197 torr at 280 K and a boiling point of 40oC. Calculate the heat of vaporization of dichloromethane.

P2 = 197 torr T2 = 280 K

P1 = 760 torr T1 = 40oC +273 = 313 K

1. (3 points) Draw two molecules of water and identify the hydrogen bonds that will form.
2. (3 points) Which of the two compounds do you expect to have the higher boiling point, CH3OH or CH3SH? Explain your reasoning

CH3OH should have the higher boiling point because it is more polar and is better at forming hydrogen bonds therefore the molecules will be more tightly attached and harder to separate resulting in a higher boiling point.

1. (3 points) Which of the two compounds do you expect to have the higher vapor pressure, CH4 or CH3CH3? Explain your reasoning

CH4 will have the higher vapor pressure because it has lower dispersion forces since it has fewer electrons. Lower intermolecular forces means it is easier to evaporate and the vapor pressure will be higher.

1. (3 points) Which of the two compounds do you expect to have the higher viscosity, CH3CH2OH or CH3OCH3? Explain your reasoning

CH3CH2OH will have the higher viscosity because it is the only molecule that can hydrogen bond meaning it will have stronger intermolecular forces and a higher viscosity because the molecules will not be able to slide past each other as easily.

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Quiz 10B (20 points) May 5, 2008

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1. (8 points) Carbon tetrachloride has a vapor pressure of 61.5 torr at 285 K and a boiling point of 76.7oC. Calculate the heat of vaporization of carbon tetrachloride.

P2 = 61.5 torr T2 = 285 K

P1 = 760 torr T1 = 76.7oC +273 = 350 K

1. (3 points) Draw two molecules of water and identify the hydrogen bonds that will form.
2. (3 points) Which of the two compounds do you expect to have the higher vapor pressure, CH3OH or CH3SH? Explain your reasoning
3. (3 points) Which of the two compounds do you expect to have the higher viscosity, CH4 or CH3CH3? Explain your reasoning
4. (3 points) Which of the two compounds do you expect to have the higher boiling point, CH3CH2OH or CH3OCH3? Explain your reasoning

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Quiz 10C (20 points) May 6, 2008

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1. (8 points) Ammonia has a vapor pressure of 255.7 torr at 220 K and a boiling point of −34.3oC. Calculate the heat of vaporization of ammonia.
2. (3 points) Draw two molecules of water and identify the hydrogen bonds that will form.
3. (3 points) Which of the two compounds do you expect to have the higher boiling point, CH3OH or CH3SH? Explain your reasoning
4. (3 points) Which of the two compounds do you expect to have the higher vapor pressure, CH4 or CH3CH3? Explain your reasoning
5. (3 points) Which of the two compounds do you expect to have the higher viscosity, CH3CH2OH or CH3OCH3? Explain your reasoning

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Quiz 10D (20 points) May 6, 2008

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1. (8 points) Nitrogen has a vapor pressure of 289 torr at 70 K and a boiling point of −196oC. Calculate the heat of vaporization of nitrogen.
2. (3 points) Draw two molecules of water and identify the hydrogen bonds that will form.
3. (3 points) Which of the two compounds do you expect to have the higher vapor pressure, CH3OH or CH3SH? Explain your reasoning
4. (3 points) Which of the two compounds do you expect to have the higher viscosity, CH4 or CH3CH3? Explain your reasoning
5. (3 points) Which of the two compounds do you expect to have the higher boiling point, CH3CH2OH or CH3OCH3? Explain your reasoning